

EARLY ABORIGINAL FISHING TECHNOLOGY IN THE LOWER MURRAY, SOUTH AUSTRALIA

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CLARKE, PA. 2002. Early Aboriginal fishing technology in the Lower Murray, South Australia. *Records of the South Australian Museum* 35(2): 147–167.

The early Aboriginal fishing technology of the Lower Murray region of South Australia is described and compared with other areas in south-eastern Australia where fish was a dominant dietary component of hunters and gatherers. This is a study of cultural geography, the chief concern being a description of hunting and gathering techniques and their significance to Aboriginal occupation of the landscape.

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INTRODUCTION

Aboriginal fishing technology in the Lower Murray region is discussed from the pre-European period to the early years of European settlement. A major aim is to describe how hunting and gathering techniques used by Lower Murray people made their region culturally distinctive (Fig. 1).¹ This region is defined as the area from Cape Jervis in the west, east to Wellington on the Murray River and south to Kingston, taking in the whole of the Lower Lakes, Coorong and associated coastal belt. It is estimated that just prior to European settlement, the region supported a population of 5000 Aboriginal people, although this figure was probably seriously affected by two early waves of smallpox (Brown 1918: 230; Campbell 2002: 119–133; Clarke 1994: 57–63; 1995: 156, footnote 1; Gale 1969). The descendants of these people, many of whom still live in the region, generally call themselves Ngarrindjeri (Berndt & Berndt 1993; Clarke 1994; Hemming & Jones 2000; Jenkin 1979).²

In the Lower Murray region the Murray River flows from Murray Bridge to Lake Alexandrina

through an open valley cut across a very low and flat limestone karst plain, which is less than 30 metres above sea level (Fenner 1931: 81–83; Twidale 1968: 148–149, 383–384). Below Wellington, the river becomes two large lakes (Alexandrina and Albert) and a series of channels in the form of a delta, eventually exiting behind scattered islands at the Murray Mouth.³ Here, the river meets the Coorong, which drained the South East region of South Australia before European intervention.⁴ The sea, winds and tides combine to drive the river back with heavy sand dune systems, called Sir Richard and Youngusband Peninsulas (northwest and southeast parts, respectively).⁵ From the point of view of the early Aboriginal inhabitants, the delta of the Lower Murray provided the region with many kilometres of shoreline for hunting and gathering activities.

The climate of the Lower Murray region is influenced by the powerful 'controls' of its temperate latitude, the proximity of the sea and the relief of the land (Fenner 1931: 125; Howchin 1909: 142; Penney 1983: 85–93; Schwerdtfeger 1976: 75–86). Upstream, long sections of both the Murray River and its main tributary, the Darling

¹ Hunting and gathering practices in the region since the 1940s are discussed elsewhere (Clarke 2002).

² The Ngarrindjeri (= Narrinyeri) were formerly made up of descent groups who spoke one of several dialects, such as Ramindjeri, Yaraldi (= Jarildekald) and Tangani (= Tanganekald).

³ Lake Alexandrina is called 'Lake Victoria' on some early official maps (Cockburn 1984: 7).

⁴ The Coorong was formerly known as the 'South East Branch' in reference to Lake Alexandrina, which it joined at Pelican Point (Cuique [R. Penney] in the *South Australian Magazine*, September 1842, vol. 2: 18–23).

⁵ Due to the action of the ocean currents, the location of the river exit into the sea is constantly moving; at present it is migrating northwards towards Goolwa at the rate of several metres per year (F. Tuckwell, pers. comm.). The complete disappearance of Barker Knoll at the Mouth as early as 1859 (Linn 1988: 78) indicates that some movement is a natural feature.

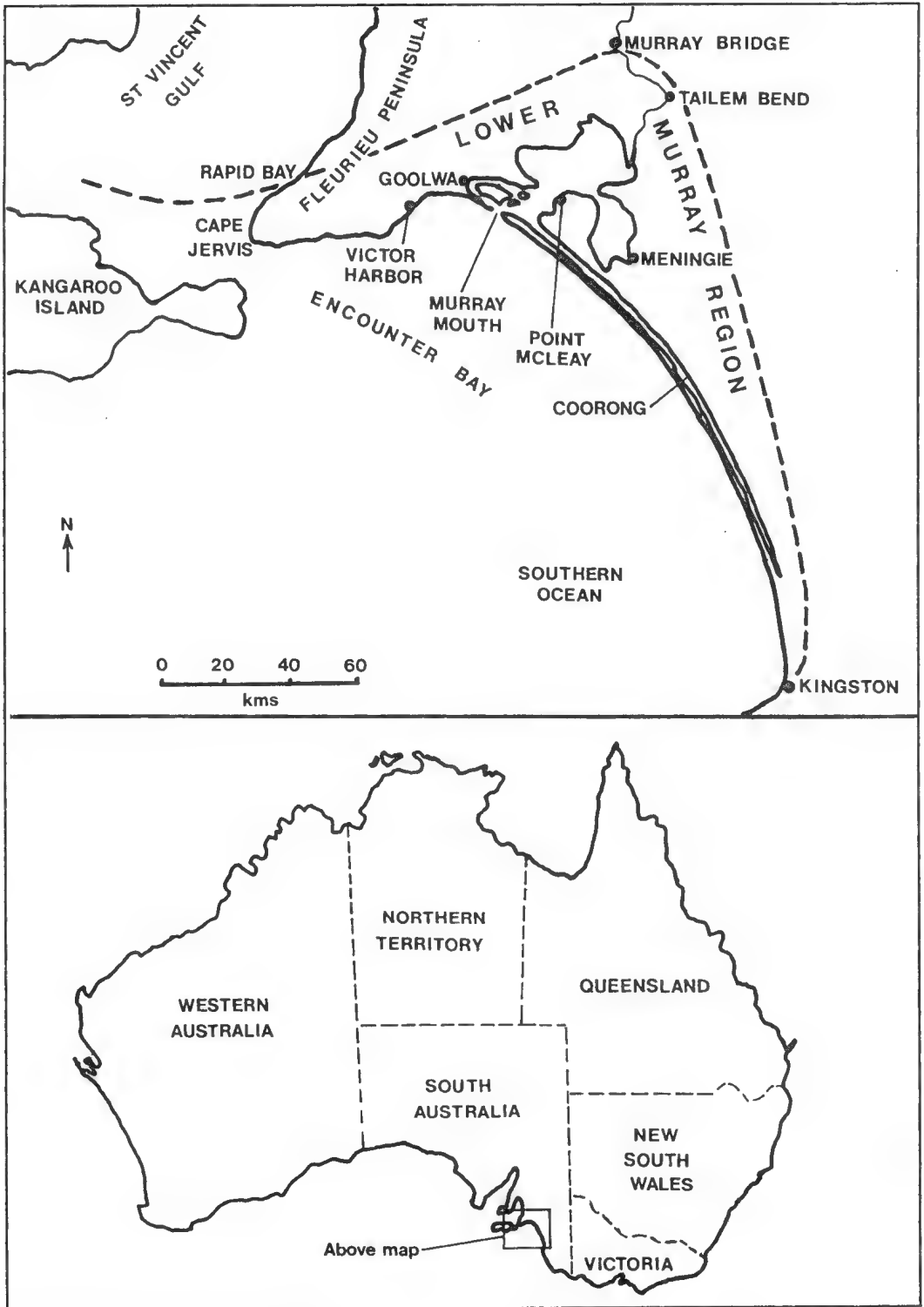


FIGURE 1. The Lower Murray cultural region.

River, flow through semi-arid regions. Nevertheless, the Lower Murray region is entirely contained within the high rainfall area of South Australia, receiving 350–750 mm per year. It comes under the rainfall shadow of the Mount Lofty Ranges to the west, with precipitation also increasing near the coast. Annual average temperature throughout the region is less than 18°C, with the greatest range of temperatures being during the summer months (Fenner 1931: 65, 126; Griffin & McCaskill 1986: 50–51; Laut et al 1977).

SOURCES OF ABORIGINAL ENVIRONMENT USE DATA

The literature of Aboriginal hunting and gathering technology for the region is based on four main sources of data — the archaeological record, the historical ethnographic record, scientific analysis of the properties of naturally occurring substances and contemporary research with Aboriginal people. This paper deals mainly with historical ethnographic sources of information, which includes artefacts collected from living people. Archaeological investigations provide evidence of the importance of fish in the diet of coastal/riparian Aboriginal groups, with an indication of the material cultural items and the main species fished.⁶ Biological analysis of human bone also assists in determining the pre-European diet (Pate 1997, 1998, 2000). Scientific methods of analysis of food sources, such as those determining the pharmacological and nutritional properties, can illustrate their potential human uses. The literature investigating the usefulness of Australian fish as food and medicine includes Brand Miller et al (1993: 222–223), Clarke (1989: 3) and Isaacs (1987: 153–164). Nevertheless, cultural perceptions influence the potential use of plants and animals, with not all available resources being fully utilised. To understand how Lower Murray Aboriginal people used their environment, and thereby moulded their cultural landscape, we must at present rely primarily on records made by early European observers, supplementing this with ethnographic data from contiguous riparian/coastal regions.

Although useful data on pre-European plant use, such as species identification, method of use and seasonality, can be obtained from

contemporary fieldwork with Aboriginal people, there are significant post-European changes in Lower Murray Aboriginal culture and in the physical landscape itself. For instance, information received from Lower Murray Aboriginal people in recent times on bush foods used during the last 50 to 60 years indicates far less use of roots than before (Clarke 1988: 64). In contrast, other indigenous foods such as fish, waterfowl, kangaroos, emus and berries continued to be used in restricted contexts. Nevertheless, the introduction of foreign species, such as European carp, and environmental changes in the waterways have decreased numbers of some Australian fish species. The availability of European-type foods, especially flour, potatoes and canned foods, obtained from missions, farm stations and towns led to a decline in many indigenous food sources. The decrease in 'bush food' consumption was particularly marked for those species requiring significant labour expenditure. Other foods were replaced by European varieties with more favourable properties. The bulrush root, for example, contains a great deal of fibre that makes eating difficult. Unlike earlier Aboriginal foods, many European sources were available at all times of the year because they were imported.

The detailed recording of Aboriginal culture in the Lower Murray region started with the German Heinrich A. E. Meyer, who ran a mission at Encounter Bay during the late 1830s and early 1840s (Meyer 1843, 1846). From him we obtain a Ramindjeri-speaker's view of Lower Murray culture. The Englishman George Taplin established an Aboriginal mission at Point McLeay on the south-western shore of Lake Alexandrina in 1859. In the 1870s he published two main books on Ngarrindjeri (= Narrinyeri) culture, based on records in his journals (Taplin 1859–79, 1874, 1879). Taplin used Ramindjeri sources as a guide to his research, although local Aboriginal groups living around Point McLeay were mainly Yaraldi-speakers. He described people who were feeling the impact of European expansion and the considerable changes it had brought upon them and the Lower Murray landscape, particularly at the northern end. One of Taplin's initiatives to improve their circumstances was to establish a local fishing industry for Aboriginal people at the mission (Jenkin 1979: 97–98, 110–111).⁷

⁶ For an archaeological overview of the Lower Murray / South East districts, see Campbell (1934, 1939, 1943), Campbell et al (1946), Luebbers (1978) and Pretty et al (1983).

⁷ There are many entries in Taplin's journals concerning the establishment of the fishing industry. The important references are 21 September 1859, 18 October 1859, 25 November 1859, 22 December 1859, 11 January 1860, 7 February 1860, 15 February 1860 and 1 March 1860.

Adding to the missionary records in the 19th century are the recordings of colonists such as George French Angas (1847a, 1847b), William A. Cawthorne (1844 [1926]), Dirk M. Hahn (1838–39), Richard Penney (1840–43)⁸ and William Wells (1852–55). During this century, various anthropologists studied Lower Murray Aboriginal culture: Ronald M. Berndt (1940; with Catherine H. Berndt 1993), Alison Harvey (1939ms, 1943) and Norman B. Tindale (1930–52, 1931–34, 1934–37, 1935, 1937, 1938, 1938–56, 1941, 1981, 1987; with Mountford 1936; with Pretty 1980). Their accounts are rich in detail concerning past hunting and gathering practices, filling many gaps that were left in the early historical record. They also contain examples of post-European innovations by indigenous people. Largely due to the interests and efforts of the Director of the South Australian Museum, Edward C. Stirling, and Ethnology Curator, Norman B. Tindale, the South Australian Museum possesses a large collection of early artefacts from the Lower Murray region.⁹ In the 1980s the present author commenced studying Aboriginal relationships to the physical landscape (Clarke 1985a, 1985b, 1986a, 1986b, 1987, 1988, 1989, 1994 chapter 4, 1998, 1999b, 2001a). The region and Aboriginal relationship to it also featured in the Hindmarsh Island Bridge controversy (Bell 1998; Stevens 1995; Wilson 1998). The attention that scholars have directed towards the Lower Murray has meant that it is ethnographically one of the best-described regions in southern Australia. The biases within this literature are discussed elsewhere (Clarke 1994 section 11.3, 1999a: 149–151, 2001a: 19–20).

EARLY ABORIGINAL FISHING TECHNOLOGY

In the pre-European period the high Aboriginal population along the river frontage and the coastal zone of South Australia was in sharp contrast to the sparse population in the interior. In the Murray Basin region the distribution of people was estimated to be 0.4–0.5 square kilometres for each

individual, in contrast to 31–88 square kilometres required in Central Australia (Jones 1974: 326; Lawrence 1968: 72–73; Maddock 1972 [cited Rose 1987: 22–23]; Meggitt 1962 [cited Abbie 1976: 46–47]; Smith 1980: 68–90; Tindale 1981: 1860). It has been demonstrated that the physical environment of the Lower Murray formed both a natural and cultural region (Clarke 1994). Stable isotope research on human bone indicates that, in general, neither people nor foods were moving from the Murray Bridge area to the adjacent Murray Mouth and Coorong (Pate 1998). The Lower Murray therefore formed a separate hunting and gathering region. Nevertheless, some aspects of the material culture and natural resource use by Aboriginal people here was similar to that of riverine and coastal communities described from elsewhere in Australia (Hallam 1975; Lawrence 1968: 85–122; Lourandos 1997: 195–243).

In the 1930s Tindale mapped many of the favourite fishing places and lookouts in southern South Australia, from informants such as Louisa Eglinton (Narangga woman), Milerum (Clarence Long, Tangani man) and Albert Karloan (Yaraldi man).¹⁰ In the Tangani language, elevated areas used as ‘watch places’ were called *popaldi*, whereas in Ramindjeri they were *koinkoinj*.¹¹ Older men generally used these when looking out for fish shoals and bird movements, as well as for monitoring the movements of their neighbours by observing the smoke from their campfires. In comparison to adjacent regions, such as the Murray Mallee and Mount Lofty Ranges, the Lower Murray landscape offered Aboriginal people abundant opportunity to make fish a more significant food source.

Before the arrival of Europeans, Aboriginal people in southern Australia did not widely use the fishhook and line (Curr 1883: 110; Davies 1881: 129; Eyre 1845, vol. 2: 266–267; Massola 1956; Meyer 1846 [1879: 192]; Olsen 1991: 5).¹² Nevertheless, the use of bone bi-points or fish gorges (*muduk*) and fishing lines has been recorded from along the Murray River (Flood 1999: 48; Gerritsen 2001; Pretty 1977: 321–322). Similar items have been recorded from the

⁸ Newspaper articles by Richard Penney between 1840 and 1843 are reprinted in the *Journal of the Anthropological Society of South Australia* 1991: 1–107.

⁹ From 1988 to 1999, a major exhibition on Aboriginal culture in the Lower Murray, called ‘Ngurunderi, a Ngarrindjeri Dreaming’, was open at the S.A. Museum (Hemming & Jones 2000).

¹⁰ Tindale Aboriginal Site Maps of southern South Australia, South Australian Museum Archives, Adelaide. Also see Tindale (1935–60: 15).

¹¹ Tindale (no date, ‘Milerum’, Stage A, #9, Archives, South Australian Museum, Adelaide).

¹² Tindale (1934–37: 285) recorded a description by Karloan (Karlwan) of fishhooks being made from bone, gum and stick, but this was possibly a post-European development.

Gippsland and Geelong areas of southern Victoria (Smyth 1878 vol. 1: 391). Shell fishhooks have also been recovered from coastal shell middens in eastern Victoria (Mulvaney & Kamminga 1999: 292).

After Europeans arrived, Aboriginal people in the Murray River and Lower Murray regions adopted new fishing techniques and appeared to have made their own version of the fishhook.¹³ In 1938 Tindale recorded Albert Karloan who said:

Our fish hook was made from a bone of a kangaroo tied like a real fish hook to another piece which was the point but our old folks used the fish spear all the time; nothing was as good as the real fishing spear! We walked along the banks & got fish in the reeds (Tindale 1930–52: 42).

European twine, hooks and lines were also handed out at the Point McLeay Mission (Taplin Journals: 18 September 1862). Fishing techniques used in the Lower Murray region included netting, spear and club fishing, trapping and opportunistic collecting.

NET-FISHING

The Ngarrindjeri people referred to the act of netting fish as *ngerin* (Taplin 1879: 130). Marine net fishing often involved the coordination of a large number of people. Worsnop provided a vivid account of Aboriginal people sea fishing in the 19th century. He records:

In Encounter Bay I have seen the natives fishing almost daily. Two parties of them, each provided with a large net, square in form, with a stick at either end, and rolled up, swam out a certain distance from the shore, and then spread themselves out into a semicircle. Every man would then give one of the sticks round which his piece of net was rolled to his right hand man, receiving another from his left hand neighbour, bringing the two nets together, thus making a great seine. They now swam in towards the shore, followed by others of their number, who were engaged in splashing the water and throwing stones, frightened the fish and prevented their escape from the nets (Worsnop 1897: 90–91).

George French Angas painted two men fishing

with a seine net at Second Valley, south of Adelaide, in 1844 (Angas 1847a: Plate XXI). Cawthorne provides a similar scene, in watercolour, at Second Valley, dated c.1842 (figure in Hemming & Jones 2000: 9), as does Snell in his sketches, dated 14 July 1850, at Yorke Peninsula (Snell 1849–59 [1988: 128]). Eylmann (1908: 375 & Plate XXXIV fig. 3) published a drawing of two Ngarrindjeri men using a long seine net, with a third man helping to drive the fish in. It is likely that several nets were sometimes connected together with supporting sticks.¹⁴ In situations where nets were not available, branches could be used to drive the fish up on the beach (Angas 1847b: 112). A former colonist wrote to Tindale stating that in the Port Germein area, north of Adelaide:

On occasions a wall of prickly bushes was built in about three feet [one metre] of water and rolled shorewards, the ends converging to an arc. The fish which were impaled or caught were extracted by the pushers and thrown to others following behind (Parkes 1936, cited in Tindale 1935–60: 48).

The 'wall' of branches, comprised of saltbush and mangrove, was called *winda* and required two people to roll it and two more for picking out the fish (Parkes 1936, cited in Tindale 1935–60: 96).

Net fishing in fresh water required fewer people than sea fishing, with small nets used to catch fish living amongst reeds and logs. Nets were essential items of Lower Murray material culture for fishing in the lagoons of the Lower Lakes, Coorong, Murray River and in the creeks of the southern Fleurieu Peninsula. In the Encounter Bay area, Aboriginal women also caught tadpoles from claypans with fine meshed nets and cooked them in large 'mutton-fish' shells (Worsnop 1897: 83).

There was some degree of specialisation in the nets used by Lower Murray people. Harvey (1943: 111) described three main types of nets used by Yaraldi-speaking people of the Lower lakes. Nets with a small mesh, *jatrumi* [pronounced 'yatrumi'], were used when fishing for *kanmuri* (mullet, *Aldrichetta forsteri*). The nets with a larger mesh, *neri*, were used for *tukkeri* (bony bream, *Nematalosa erebi*). The big drum nets, *dongari*, were mainly for catching *pondi* (Murray cod, *Maccullochella peeli*) found under large logs

¹³ In 1932 Tindale (1953: 42) recorded from a European named Arthur White that Aboriginal people living along the river had used a double-pointed wooden fishhook. Tindale (no date, 'Milerum', Stage A, #3, Archives, South Australian Museum, Adelaide) also claimed that they used a fishing toggle made from bone as a form of fishhook.

¹⁴ This technique was also used in southern Yorke Peninsula (Tindale 1936: 57).

submerged in the river.¹⁵ The drum nets were made with sticks in the form of a rectangular pouch (Harvey 1943: 111).

The Tangani people of the Coorong used specialised nets, such as the *jataruma* [pronounced 'yataruma'] to catch mullet and the *donggari* to catch mulloway (*Argyrosomus hololepidotus*) and other big fish (Tindale 1934–37: 226). They also used the *ngeiri* net, which was made from the same sedges that were collected for basket and mat making. All nets used by Tangani people in the pre-European period were for hauling (Tindale 1934–37: 226). The Tangani used a hooped fishing net, termed *kandarangku*, with a mesh of 2.5 cm, for larger fish (Tindale 1951: 258). Apparently the term is a play on words meaning 'widow catcher', as *kandari* is applied to coarse rope and *rangku* refers to a widow.¹⁶ Murray River people around Moorundie used the same type of net, *kanderunku*, to catch *ponku* (Murray cod).¹⁷ The Kingston people used a net called *pinang kanji* to round up fish in shallow waters (Tindale 1931–34: 89). Angas provided a small watercolour painting of a pouch-like net 'for taking very small fish from Lake Bonney' (Angas 1847a: Plate LI) in the South East of South Australia.

Aboriginal people in southern South Australia probably did not use set nets until well after European settlement. Tindale's main Lower Murray informant, Clarence Long (Milerum), claimed that set nets were rarely used in the Coorong when he was younger, and not at all before then (Tindale 1934–37: 226). This suggests that Europeans had introduced the practice to the local Aboriginal people. From available accounts, sinkers and floats were not used in association with net fishing during the pre-European period of southern South Australia. The record of Murray River people using clay from wasp nests to make sinkers for set nets is probably a post-European innovation.¹⁸ Tindale (1935–60: 17) suggested that vegetation placed along the top of the net to prevent fish from jumping out of the water might have helped keep the net vertical.

It is likely that in the pre-European period most

fishing nets in southern South Australia and Victoria were fabricated from two-ply string made from fibre obtained from the roots and stems of the bulrush (*Typha* species) (Beveridge 1883: 42; Krefft 1862–65: 361; Tindale 1935–60: 17; Zola & Gott 1992: 8–9, 62). Europeans also know this plant as flag, cumbungi and reed mace, whilst contemporary Ngarrindjeri people refer to it as *manangkeri* or *manakeri* (Clarke 2001b). It was a major food source, with the chewed remains of the roots being generally in good supply in Aboriginal camps (Clarke 1988: 69–70, 72; Tindale & Mountford 1936: 497). Tindale stated that:

... mature rhizomes were chewed and fibres made into string, the chewing for this purpose being a duty of women. Older women's teeth were often worn to the gum line by their constant chewings.¹⁹

He also suggested that the proximity of bulrush grounds would have made a good riverside camp.

In 1894 an Aboriginal man from Point McLeay, Jacob Harris, provided a detailed written account of net making from 'rushes', which were probably bulrushes. He said that before Europeans arrived, Aboriginal people in the Lower Murray region used to:

make our nets almost the same as the Europeans did, the meshes were the same, the only difference being that yours [Europeans] were made of twine etc., while ours from rushes. The rushes had to be steamed or cooked or whatever you like to call it, first a hole was dug, say a couple of ft. [= 60 cm], then a fire was placed in it, after it had burned almost to ashes some damp or wet grass was put on the coals, then the rushes, so that the steam arising from the grass would steam or cook ... put in about evening and left until morning, it was then taken out and divided among the camp to chew or suck the juice out of it, which is very sweet, it was then made or twisted into a line for to be made into a net. ... the meshes were the same [as European nets].²⁰

Angas stated that the marine fishing nets were 'composed of chewed fibres of reeds, rolled upon

¹⁵ Descendants from the Yaraldi and Maraura people from the Lower Lakes and Murray River regions made S.A. Museum drum net, A21338, in 1934.

¹⁶ Tindale (no date, 'Milerum', Stage A, #3, Archives, South Australian Museum, Adelaide).

¹⁷ Tindale, 'Ngaiawung vocabulary', Archives, South Australian Museum, Adelaide. Also see Scott (cited Tindale 1951: 258).

¹⁸ Tindale (no date, 'Milerum', Stage A, #3, Archives, South Australian Museum, Adelaide).

¹⁹ Tindale (no date, 'Milerum', Stage A, #3, Archives, South Australian Museum, Adelaide).

²⁰ J. Harris letters (D6510(i))14,15, Mortlock Library, Adelaide). Tindale (1934–37: 164) received a similar description of the process from his Ramindjeri informant, Reuben Walker.

the thigh, and twisted into cord for the purpose' (1847a: Plate XXI).²¹ Emu oil was sometimes rubbed into the fibre while it was being made into two-stranded cord (Tindale 1931–34: 60). Fibre treated in this manner makes the string more supple, while maintaining its strength and durability. Tindale (1951: 257) maintained that Aboriginal cordage from all areas of Australia was always composed of single or two-ply twists, never three or more. Nevertheless, there were exceptions. For instance, West (1999: 20, 23–28) describes the making of three-ply rope in Arnhem Land and possibly Tasmania.

After European settlement, changes in the Aboriginal diet would have led to a significant decrease in the availability of fibre from bulrush roots. Fibre used by Lower Murray people to make string for nets also came from an unidentified plant known in the local Aboriginal language as *calgoonowrie* (MacPherson, no date: 10). A plant recorded as used for making Coorong nets was *kuka* (native flax, *Linum marginale*).²² In 1932 an informant from the Maraura people of the Upper Murray of South Australia, Frank Fletcher, said that gill nets and drag nets were both made from the *pungur* rush (Tindale 1953: 23).²³ Harvey (1943: 109–110, 112) stated that the stems of *jalkeri* (knobby club rush, *Isolepis nodosa*) were used for making nets.²⁴ But field investigations have indicated that the stems of this rush are pithy and not suitable for making string or baskets. The stems of *mangatu* (spiny sedge, *Cyperus gymnocaulos*) would have been better; this species is still used by local Aboriginal people who make baskets and mats from it.²⁵ Nets made from sedge stems were also made for dry uses, such as catching ducks.²⁶

The technique used to make nets in southern South Australia has been variously described as

'knotted netting' or 'knotted looping' (Davidson 1933: 257–259, 269–272, figs 1, 9–10; West 1999: 30–33, 49). The Tangani people called the mesh of the net, *mandar*, which reputedly meant 'the eyes'; the netting knot or tie was *mulbakan* and the act of making a net was *lagulun* (Tindale 1934–37: 226). The last term is a reference to the threading motion of making the knot being like 'spearing'.²⁷ In the Ramindjeri language of Encounter Bay, *lakk-in* was recorded as 'spearing; weaving (as rushes for a basket)' (Meyer 1843: 74). The mesh sizes for nets in southern South Australia were variable, in the range 1–2.5 cm with the Kongarati Cave fragments, 2.5 cm recorded for the Coorong hoop net and 8 cm for netting wrapped around a desiccated body found at Fromm Landing, Murray River.²⁸

SPEAR AND CLUB FISHING

During the day, men caught fish such as *malawe* (mulloway, *Argyrosomus hololepidotus*) by standing motionless in the river or in their canoes (Hemming & Jones 2000: 9; Meyer 1846 [1879: 192–193]; Smith 1930: 230–231; Snell 1849–59 [1988: 182]; Tindale 1934–37: 7). Fishers attracted the fish by their shadows and stabbed them with hand-held spears. Large spears made from *Callitris* pine with two to three wooden prongs lashed to the head were used for spearing mulloway and Murray cod.²⁹ Being large, these spears were also used as punting poles when fishers were travelling on bark canoes and rafts (Hemming & Jones 2000: 9). It is likely that these spears were hidden near the area of their use when the fishing season was over. In the Lower Lakes area fishermen frightened fish from their hiding places by a large noise, created by thrusting one

²¹ A supporting reference is Angas (1847b: Plate LVI). An example of a net made from *Typha* fibre is A2000, collected from the Lower Lakes district.

²² Tindale (no date, 'Milerum', Stage A, #3, Archives, South Australian Museum, Adelaide).

²³ The term *pungur* may relate to the *punguriko* specimen of *Juncus* species collected by Tindale from Swan Reach, 5 August 1964 (A68584, South Australian Museum). If so, then the plant referred to for net-making was probably of the same species. Similarly, a related term, *puungort*, is a Western Victorian Aboriginal term for the basket sedge, *Carex tereticaulis* (Robson 1986).

²⁴ This plant was formerly known as *Scirpus nodosus*.

²⁵ Examples of River Murray fishing nets made from sedges (*Cyperus* species) in the South Australian Museum include specimens A17529, A21338, A26250, A45090. The term *mangatu* was recorded from Aboriginal sources in the 1980s (Clarke 2001b).

²⁶ See figure in Hemming & Jones (2000: 13). Satterthwait (1986: 39–40) provided an overview of the use of nets for catching waterfowl in Aboriginal Australia.

²⁷ In the Ngarindjeri language of the Lower Lakes, *lakelun* was recorded to mean 'spearing' (Yallop & Grimwade 1975: 33–34, 85–86).

²⁸ Tindale (1951: 258) reported on specimens A65091, A25351 and A20616, respectively. Smyth (1878: 389–390) discussed mesh sizes for Victorian nets.

²⁹ In 1936 Tindale collected a 3.1 m-long fishing spear (Museum specimen A26093) made of pine from the Coorong. This specimen has two prongs lashed to the head and was called *punkularipuri ma:wantj* in the Tangani language. In 1844 G. French Angas painted a close-up of a large spear with three prongs lashed on (Angas collection, Archives, South Australian Museum, Adelaide — see Angas 1847b: Plate XXX). This watercolour is reproduced in Hemming & Jones (2000: 9).

of these pronged spears into the water (Unaipon 1924–25 [2001: 19]). The compressed air caught between the prongs rose to the surface with a loud report. There is an account of spear-fishing competitions held from November to April among the Piltindjeri group of Yaraldi-speaking people living along the southeastern shore of Lake Alexandrina, with the fish caught being presented to senior people in the community (Smith 1930: 231–236; Unaipon 1924–25 [2001: 19–24]). In this instance, it required skill in fish tracking, involving the detection of movements in pondweed, reeds and water ripples.

At night, a fire was used to attract fish to be struck by spear or club (Angas 1847b: 112). Angas painted a club called a *wadna*, which was 'used by the Port Lincoln natives, to throw at fish whilst swimming' (Angas 1847a: Plate LI). Similar bent elongated clubs from the Lower Murray are also in the Museum collection. Clubs like these and described as boomerangs were reported as used along the Coorong (Olsen 1991: 5). Sometimes a bark canoe was used as a platform to fish from, with a fire contained by a clay hearth in the middle that also served to cook the catch (Angas 1847b: 54, 101, 107; Meyer 1846 [1879: 193]).³⁰ Mobility across water was important for the fisherman in order to reach areas favoured by particular species of fish. Therefore, rafts made from reed stems (*Phragmites australis*) and grasstree flower-stalks (*Xanthorrhoea* species) would also have been important items of fishing material culture in the Lower Lakes and along the river lagoons.³¹ Although relatively common along the Murray River and in the Lower Lakes, bark canoes were rarely seen in the Coorong lagoon, and even then only for bringing in trade items.³² Red gum trees (*Eucalyptus camaldulensis*) required for bark are found only in permanent freshwater regions, such as along creeks in the southern Fleurieu Peninsula and along the Murray River. There is no evidence that any form of watercraft was ever used for sea fishing, although short trips were made on reed rafts or floats to nearby rocky islands in order to kill seals there (Tindale 1941: 241).

OPPORTUNISTIC HARVESTING

There are documented cases of Aboriginal use of fish poisons in small lagoons of the upstream reaches of the Murray River bordering northern Victoria (Curr 1883: 110). Nevertheless, Taplin doubted that Ngarrindjeri people possessed knowledge of the use of poisonous plants (Taplin 1879: 47). When large numbers of fish died for natural reasons, such as changes in salinity in the river or lake, Aboriginal people quickly gathered them (Eyre 1845, 2: 266). Before the construction of the barrages across the Murray Mouth separating the Coorong from Lake Alexandrina, elderly Aboriginal informants interviewed in the 1980s claimed that there were sometimes rapid changes in the water from fresh to saline (Clarke 2002). This tended to kill a large number of fish, providing an abundant but temporary source of food. At other times, the incoming salt water drove certain species, such as Murray cod, upstream and suspended fishing in the lakes until it receded (Olsen 1991: 8; Taplin Journals: 19 May 1860). Bony bream also die off seasonally in large numbers and, according to Ngarrindjeri informants in the 1980s, they had provided a temporary windfall of food (Clarke 2002).

FISH-TRAPS AND ENCLOSURES

Fish-traps and enclosures ranged from slight modifications to natural features of the landscape to special purpose-built structures (Mulvaney & Kamminga 1999: 34–35). For example, in some areas Aboriginal people were able to use the narrowing of the channels between swamps as traps in which to place netted bags. In his diary Wells records:

Just now [July] there is fish to be had out of the swamps, and we got one of the native females to make us a net. They are made of a long kind of soapy platt [sic.], but flat and round, quite as large as an umbrella top. It is then doubled not unlike a huge ankle boot, and at the two ends there is a small opening. It is then raised from the bottom in such a way that the fish when

³⁰ The South Australian Museum has a bark canoe (A6443) from Avoca Station on the Darling River that contains an early 20th century mock-up made by museum artisans of the fireplace for display. The original fireplace was made in a mud-lined wooden container (A53554).

³¹ Jacob Harris, an Aboriginal man at Point McLeay writing in 1894, claimed that the use of the 'rude kind of raft' made from reeds predated the use of bark canoes in the Lower Murray (J. Harris letters, D6510(L) 14,15, Mortlock Library, Adelaide). The South Australian Museum holds raft specimens (A14632, A14633) made by a Yaraldi woman, Amy Johnson, in 1930.

³² This statement derived from accounts by Meintang woman, Ethel Watson, and Tangani man, Clarence Long (Milerum) (Tindale 1931–34: 69, 87).

caught cannot return. The net is then fastened with sticks in a narrow channel where one swamp runs into another and all fish going with the stream are caught. These fish the blacks call Coogolthee. The nets are laid overnight and by break of day next morning we have plenty brought us for breakfast.³³

On the frontier of British colonisation, wild foods and Aboriginal labour were often crucial to the survival of European settlers (Clarke 1996). Examples of more active manipulation of the environment were the construction of long trenches by Aboriginal people to concentrate fish, in the long term saving them much labour expenditure. For instance, Smith records that in the Murray region:

In the low-lying country, alongside of the river, trenches are dug two or three hundred yards [180 or 270 metres] long and from four to five feet [1.2 to 1.6 metres] deep. When the Murray becomes flooded it overflows its banks to the extent of a mile or more [1.6 kilometres or more] on each side, and frequently the Murray cod, the bream, the butterfish, and other fish are living in this water. When the waters become low through evaporation and soakage the fish are easily caught ... They wade into the shallow water and scoop the fish into baskets made especially for this purpose (Smith 1930: 229).

These channels were often relatively large modifications of the landscape that would have had a significant impact upon the local watertable (Lourandos 1997: 219–22).

Another modification of the landscape for fishing was the building of stone and wooden fish-traps. Some fish-traps, probably the predominantly wooden ones, were known by the Ngarrindjeri name, *ku:yitaypari*.³⁴ The Yaraldi people in the Lower Lakes did not make such structures, preferring to use fishing spears instead (Tindale 1931–34: 73–75). In the Coorong fish were harder to spear due to the prolific waterweed, so the Tangani relied heavily upon stone fish-traps, *talaipar* (Tindale 1931–34: 73–75). Areas of shallow water in the Coorong, such as at the Yungurumbar crossing place, were

considered good places for making such stone fish-traps (Tindale 1931–34: 71).³⁵ The Tangani generally placed their fish-traps made from limestone blocks along the landward shore of the Coorong (Tindale 1974: 61–62). This was presumably because the water here is shallow and covers a limestone shelf, in contrast to the seaward side of the Coorong lagoon, which is deep and sandy. Tindale provided a detailed record of the construction and use of fish-traps or, as his informants called them, 'fishing-stations' (Tindale 1931–34: 73–75, 1934–37: 5). The fish-traps were generally made in the shape of a V, with one of the walls, termed *nganangkure* or *ngalde*, connecting with the bank. The wall that extended into the Coorong lagoon was sometimes up to 30 metres long. The basketware trap was placed at a gap in the base of the V. The species of fish seasonally caught in the traps included *kongoldi* (probably *congolli*), *njindumi* (an eel species), *palengoi* (unknown species), *lapalap* and *therugarai* (unknown fishes, not found in the Lower Lakes) and *teri pateri* ('sand mullet') (Tindale 1931–34: 75, 1934–37: 5).³⁶ No attempt was made to drive the fish in, relying solely on their natural movements.

At Noonamena, on the mainland side of the Coorong near Meningie, the tops of silted over fish-trap formations can still be seen. Aboriginal people interviewed by the present author in the early 1980s said that these fish-traps were naturally formed stone structures that were previously modified and maintained with stones and pieces of wood. According to Ngarrindjeri man Jack Koolmatrerie, mullet travel northwards up the Coorong during the day (Ely 1980). Upon reaching the trap, fish would swim into the wide mouth of a horseshoe-shaped line of rocks. The foundation of this was a natural reef of exposed rock with all gaps except one narrow exit shored up with logs and boulders. The mullet were forced to travel through this narrow exit where a net or basketry container put in their path would catch them.

Elsewhere in southern Australia, some of the fish-traps have been described in the literature as

³³ Wells, 16 July 1853. The species of fish referred to here is probably *kungali* (*congolli*, *Pseudaphritis urvilli*) (Clarke 2001b).

³⁴ Yallop & Grimwade (1975: 55) list *ku:yiti* as 'rushes, sticks', and *ku:yitaypari* as 'fish-trap, barrier of sticks'.

³⁵ The Yungurumbar crossing place is probably that between Rabbit Island and Junggurungbar (pronounced Yunggurungbar), a hill on the Younghusband Peninsula (see Tindale 1938, fig.1).

³⁶ The eel species referred to here is probably *Anguilla australis*. The *palengoi* was said by Tindale to be equivalent to the Yaraldi *pelangi*. This is probably the *pelangi* that Berndt & Berndt (1993: 308) described as 'mudfish' or 'butterfish'. The *lapalap* may possibly have been a species of *Galaxias*. In the case of *teri pateri* or 'sand mullet', Tindale (1931–34: 74) said that its Yaraldi name is *weialapi*. This is probably the same word as the 'welappi' or 'mullet' recorded by Taplin (1879: 131). Eckert & Robinson (1990: 19) consider that this refers to the 'jumping mullet' (*Liza argentea*).

weirs.³⁷ According to Edward J. Eyre, Aboriginal people seasonally gathered at the channels around Moorundie that connected the river flats with the Murray River:

making a weir across them with stakes and grass interwoven, [would] leave only one or two small openings for the stream to pass through. To these they attach bag nets, which receive all the fish that attempt to re-enter the river. The number procured in this way in a few hours is incredible. Large bodies of natives depend upon these weirs for their sole subsistence, for some time after the waters have commenced to recede (Eyre 1845, 2: 253).

This practice occurred during early December when the Murray River floods had already reached their highest point and were beginning to recede. Further south, in the shallow waters and swamps of Lake Frome near Burr Range, small fish were caught in weirs (Angas 1847b: 174). Also in the South East, near Rivoli Bay, Angas recorded:

On some of the swamps the natives had built weirs of mud, like a dam wall, extending across from side to side, for the purpose of taking the very small mucilaginous fishes that abound in the water when these swamps are flooded (Angas 1847b: 155).

In the pre-European period, Aboriginal modification of the riverine landscape for fishing must have been considerable. It was oral history among old river boat captains in the 1980s that before the lock system was introduced, remains of Aboriginal built fish-traps were known hazards to paddle-steamers when the water level was low (T. Sim, pers. comm.). Hahn recorded that in the Hahndorf area of the Mount Lofty Ranges, the Aboriginal people would:

build a dam into the river, high enough to let about a foot [31 centimetres] of water stream over it. Because of this dam, the fish in their run must come close to the surface of the water, where the savages stand in readiness to spear them (Hahn 1838–39 [1964: 133]).

In coastal zones weirs of brushwood constructed at mouths of creeks caught fish left by receding tides (Angas 1847b: 112). Some of the trenches, traps and weirs were designed to catch bait for much larger fish. For example, near Martin Well on the Coorong, drains 100 m in length were constructed by Aboriginal people to catch small fish, called *lap-lap*, for bait (Worsnop 1897: 106).³⁸ These were netted in fine close mesh nets. These weir and trench constructions appear similar in design to the much larger earthworks at Lake Condah in western Victoria.³⁹

Outside the Lower Murray, but elsewhere in southern South Australia, fish-traps have been recorded in the Port Lincoln estuarine area (Martin 1988; Mountford 1939), as well as at the mouth of Pedlar Creek south of Adelaide (Stapleton & Mountford, no date). In the case of the latter, the Tangani man, Milerum, knew of these traps as he and his family camped there, when he was a child, on their way to Adelaide via the coast.⁴⁰ There were also fish-traps made from large water-worn boulders at Moana Cove, also south of Adelaide, but these were in poor condition when Tindale inspected them in the 1920s.⁴¹ Some traps could be dragged out of the water when fish were not required. For instance, Charles Sturt stated that on his 1830 expedition down the Murray River he:

observed some cradles, or wicker frames, placed below high water-mark, that were each guarded by two natives, who threatened us violently as we approached. In running along the land, the stench from them plainly indicated what they were which these poor creatures were so anxiously watching (Sturt 1833, 2: 165).

Small dams or 'pounds' might not only be structures for catching fish, but were also used to keep part of the catch alive for future use. At the Point McLeay Aboriginal Mission, 'fish pounds' made of stakes were in common use by Aboriginal people during George Taplin's period there (1859–79).⁴² According to Lower Murray man

³⁷ For example, Beveridge (1883: 48); Curr (1883: 110) and Pretty et al (1983: 119). Tindale listed 'fish weir (set in creek)' as *ake* in a Murray River dialect (Tindale, 'Ngaiaiwung vocabulary', Archives, South Australian Museum, Adelaide).

³⁸ This fish, *lap-lap*, was possibly a species of *Galaxias*. *Lapps Lapps* was recorded to mean 'small fish' in the Booandik language (Smith 1880: 3). Wells (1852–55) listed *lap-lap* as 'very small fish'. Tindale (1931–34: 74) said that *lapalap* were a Coorong fish species not known in the Lower Lakes.

³⁹ For a description of the Lake Condah eel-traps, see Coutts et al (1978); Flood (1995: 240–245; 1999: 216–220); Hemming (1985); Robson (1986) and Worsnop (1897: 104–106). The S.A. Museum has a basketry trap, A6431, collected from Lake Condah, c.1910 (see figure in Hemming & Jones 2000: 9).

⁴⁰ Tindale (no date, 'Milerum', Stage A, #3, Archives, South Australian Museum, Adelaide).

⁴¹ Tindale (no date, 'Milerum', Stage A, #1, Archives, South Australian Museum, Adelaide).

⁴² The 'fish pounds' were recorded by Taplin on the shore of Lake Alexandrina (Journals, 11–12 October 1859; 8 November 1859; 11 November 1859; 28 November 1859; 10 January 1860; 21 November 1861; 20 March 1862).

Lindsay Wilson, interviewed by the present author in the early 1990s, the practice of fish storage in wooden enclosures in the lake at Point McLeay continued until the 1930s. During the early twentieth century along the Coorong, European fishermen kept alive the bream they had caught by putting them in 'pounds' made of tea-tree stakes, until the weather was suitable for transporting them to the market (Evans 1991: 40).

CULTURAL ASPECTS

Aboriginal people along the Murray River considered that their Dreaming Ancestors created the wetlands that provided them with abundant sources of food. For instance, Natone, an Aboriginal man from the South Australian section of the Murray River, claimed that a blind woman, Noreela, had created the environs of the river (Bellchambers 1931: 112, 125). Starting from Lake Victoria, Noreela, with two young children to guide her, made the river by driving back the sea. She travelled like a 'drunken bee'; her meandering course meant that the river was very long. This lengthening of her journey was considered greatly desirable, as it increased the number of fishing and hunting grounds, with a lagoon at each elbow. The fossils jutting out of cliffs along the Murray River were said by Aboriginal people to be the remains of fish killed and eaten by Noreela and her children. Another account, still told by Ngarrindjeri people in the 1980s, was of a Thukabi Ancestor, who was a large river turtle that came down the Murray River:

Thukabi [a large river turtle] came down [from the Darling district] through the desert looking for a place to lay its eggs. As she went, the drag of its tail made the river, its flipper carved out the lagoons and banks. You can see where it went. When it got to the lake, it pushed itself into the sea (H. Rankine cited Clarke 1994: 114).

In all these accounts, the present course of the Murray River is explained by the actions of Ancestral Beings.⁴³

In the Ngarrindjeri Dreaming of the Lower Murray, Ngurunderi chased a large Murray cod, Pondi, down the Murray River, widening its banks in the process, until it was eventually speared near the Murray Mouth (Berndt & Berndt 1993: 224; Clarke 1995: 148–149; Hemming & Jones 2000).⁴⁴ Whilst Ngurunderi was at the Murray River entrance into Lake Alexandrina, a water spirit known as the Mulgyewonk tore holes in his nets, which prevented him fishing for his family (Tindale & Pretty 1980: 50). There are accounts of Aboriginal legends from further upstream in Murray–Darling Basin where the dreaded river spirit who fed on boys was a large Murray cod (Sinclair 2001: 120–121, 252). Ngurunderi made the fishing grounds and lookouts for the Lower Murray people, which is told in song (Tindale 1931–34: 259).

Fish species also appear elsewhere in Lower Murray mythology. For instance, Yamakawi (Shark Ancestor) had a prominent role in the Kondoli (Whale Ancestor) Dreaming of Encounter Bay, which explained the origin of fire (Clarke 2001a: 24–25). There is also a Dreaming myth relating predominantly to freshwater fishing technology, which took place in the region from Lake Hindmarsh in western Victoria to Lake Alexandrina in the Lower Murray (Harvey 1939ms, 1943; Tindale 1934–37: 65–69). In this account the drum-nets of the pelicans were transformed into large pouches under their bills. In the Dreaming of Limi (= Lime), the love of eating fish is involved in explaining the creation of the Inman and Hindmarsh Rivers of the southern Fleurieu Peninsula (Berndt & Berndt 1993: 311; Meyer 1846 [1879: 202]).⁴⁵ The Skyworld landscape contains a fish too, with a constellation of stars being Nunganari, the Stingray (Berndt & Berndt 1993: 164, fig. 25; Clarke 1997: 131).⁴⁶

Economically important fish species were considered by the Lower Murray people to have been created by Ancestors during the creation period. For instance, in a Ramindjeri account of the Kondole (Whale) Dreaming, the Kuratje and Kanmari Ancestors became small fish when they ran in the sea:

⁴³ From the late 1980s, an animated version of this myth was given at the Signal Point Museum, Goolwa.

⁴⁴ Sinclair (2001: 120) speculated that the relatively large size that some cod grow to, up to 1.8 metres, enhanced Aboriginal beliefs of the beast's mythical qualities.

⁴⁵ Berndt & Berndt (1993: 311) suggested that Limi was a Stingray or Carpet Shark Ancestor. Meyer (1843 part 2: 75) listed 'Lime' as a 'kind of seal'. Limi and his family were eventually transformed into a group of prominent rocks in the sea at Victor Harbor near the Bluff (Meyer 1846 [1879: 202]).

⁴⁶ According to Tindale (no date, 'Milerum', Stage A, #1, Archives, South Australian Museum, Adelaide), the Tangani considered that there were seven stars shaped like a stingray.

The latter was dressed in a good kangaroo skin, and the former only a mat made of seaweed, which is the reason, they say, that the kanmari [mullet, *Aldrichetta forsteri*] contains a great deal of oil under the skin, while the kuratje [Western Australian salmon, *Arripis truttaceus*] is dry and without fat (Meyer 1846 [1879: 203]).⁴⁷

In other Dreaming accounts, the Murray cod, Pondi, was cut into smaller pieces by either Ngurunderi or Waiyungari, depending on the myth version, and thrown back into the water to become different types of fish (Clarke 1995: 148; 1999b: 53–54).

The Ramindjeri version of the Ngurunderi myth epic, recorded from Reuben Walker in 1935, starts from a large lake near mountains somewhere to the northeast of the Lower Murray and involves a large fish which is not a Murray cod:

Ngurunderi came to the Lake and speared the fish which, made off with it at a great speed and cut a deep track right down to Lake Alexandrina. Ngurunderi followed and noticed that the river thus formed was without fish. So he stood on the bank and broke the bark of the red gum tree (*wuri*) up into shreds & threw it into the water and said; you are Murray cod. This must be true because, when you cut open a Murray cod you can see a tree like mark of blood vessels on the walls of its body; it is just like a gumtree. Ngurunderi then threw in *pujulanki* bush (Native wild grape? *Cryptandra hispidula*) and this became catfish (*Tandanus tandanus*). He threw in peppermint gum bark (*tentumi*) and it became the *tjiri* (*Terapon bityanus* Mitchell). After he had made all the best fishes he threw in a piece of refuse and it became the Bony bream (*tukari*, *Fluviolosa richardsoni* (Caselman)).⁴⁸

In relation to the blood vessels, it is worth noting that along the Murray European fishers have an analogous belief which interprets the tree-like markings on cod swim bladders as 'skin maps' that show the birth place of the individual fish (Sinclair 2001: 124–127). Tindale recorded from a European settler the following Dreaming account involving Matumeri who:

... chased a large fish from the sea entrance of the Murray Mouth up through the Lake until he caught it out off Poltallock [Poltaloch Station] where he killed it and pulled it to pieces and threw the pieces all about and they turned into small fishes and that is how the different sorts of

fish came (RD Anderson 1934 [cited in Tindale 1934–37: 175]).

The Ancestor mentioned here is probably Matamai, who was Ngurunderi's son (Clarke 1995: 146). The theme of an Ancestor tearing up large beings to make many smaller species also occurs in relation to kangaroos according to one account of the Waiyungari mythology (Clarke 1999b: 54).

Aboriginal people considered themselves as having a role in the continuation and wellbeing of their environmental resources. Ceremonies were sometimes performed in order to increase fish supply. For instance, Howitt relates:

There is a spot at Lake Victoria [= Lake Alexandrina], in the Narrinyeri [= Ngarrindjeri] country, where when the water is, at long intervals, exceptionally low, it causes a tree-stump to become visible. This is in charge of a family, and it is the duty of one of the men to anoint it with grease and red ochre. The reason for this is that they believe that if it is not done the lake would dry up and the supply of fish be lessened. This duty is hereditary from father to son (Howitt 1904: 399–400).

The illicit involvement between Waiyungari and Nepeli's wives in the Ngarrindjeri Dreaming was perceived as the cause of poor fishing in early spring each year. The arrival of the Young Men (Orion) and the Women (Pleiades) constellations in September was considered to help turn this around (Berndt & Berndt 1993: 164; Clarke 1999b: 57). The flowering of certain plants may also have been an indication of the arrival in the Lower Murray of certain species of fish. This was the case at Marion Bay in Yorke Peninsula, where the prolific flowering of tea-trees was a sign to the Narangga people that the mullet fish were soon to come in large numbers.⁴⁹ Here, it was claimed that initiation ceremonies were held then to take advantage of this seasonally abundant food source.

The abundance of fish would have allowed for a larger Aboriginal population in the Murray Basin in comparison to the surrounding regions. The Lower Murray was particularly rich in fish resources, involving marine, estuarine and freshwater species (Eckert & Robinson 1990; Evans 1991; Glover 1983; Olsen 1991; Sim et al 2000). Angus said 'The Milmenduras subsist

⁴⁷ Identification of these fish names is given by Eckert & Robinson (1990: 19–20). Note that *kuratye* is equivalent to *kuratje*.

⁴⁸ Tindale (1930–52: 119). [Italics by the present author.]

⁴⁹ Reminiscences recorded by E. Davies in the *Mail* newspaper, Adelaide, on 25 March 1952.

chiefly on fish, and though extremely wild and treacherous, present some of the best specimens of the Aboriginal Inhabitants, as regards physical appearance' (Angas 1847a: Plate XI). Angas also commented that 'On the S. E. coast and along the shores of the Murray and Lakes Alexandrina and Albert the natives live chiefly upon fish, and waterfowl' (Angas 1847a: General Remarks).⁵⁰ Aboriginal people considered that some of the spirits with whom they shared the landscape also liked eating fish. For example, Lower Murray people believed that the dreaded river spirit, the Mulgyewonk, was attracted to the smell of fish and once captured a young boy who was washing fish oil from his hands on the edge of the lake (Clarke 1999a: 157; Harvey 1939ms).

From the daily account available in Taplin's Journals, it is clear that fish, termed *mame* in general, were a favourite food item in the Lower Murray region. Ngarrindjeri people considered that the dominance of fish in their diet set them apart from at least some of their neighbours. They gave cultural significance to the fact that when their babies tried to speak, their first word was *mam* (Taplin Journals: 10 October 1861). Adults proudly interpreted this as the infant's desire to eat fish. The fish entrails, *ngarakuni*, were considered good eating, being grilled over the coals with the edges of the fillet curled up to catch the juices.⁵¹ Special sticks, *wunupi*, were used as fire tongs to remove food, such as fish, from hot coals.⁵² Fish remains are often found in Aboriginal middens on the banks of the Lower Lakes and Murray River (Luebbers 1978, 1981, 1982; Pretty et al 1983: 117–118; Tindale 1930–52: 67).

Some Aboriginal groups in southern South Australia were noted by their neighbours for having a diet dominated by fish. This is shown by a recorded remark by Parnkalla people of northeastern Eyre Peninsula that their Port Lincoln neighbours, the Nauo, had 'an offensive breath, being fish eaters' (Schürmann 1844, 1: 7). In the Lower Murray, Murray cod oil was rubbed on initiates (Tindale 1930–52: 139). The Tangani people of the Coorong had a song 'ridiculing men

who refused to lend their fishing net' (Tindale 1934–37: 267).

The material culture of the Lower Murray people reflected their fishing background. Old fishing nets were used in the Murray Basin for wrapping human bodies that had already been desiccated (Sheard et al 1927: 173; Tindale 1951: 258; Tindale & Mountford 1936: 495, 499). In the Lower Murray, fishing nets were often among the personal items placed in burial bundles lodged on tree platforms (Hackett 1915: 29). Stingray tail barbs or 'nails' were used in *ngildjeri* sorcery (Berndt & Berndt 1993: 260). In the Murray River area, Tindale recorded the medicinal use by Nganguruku people of Eucalyptus leaves, *tindunj*, with fish fat. Apparently they would 'infuse leaves in bark dish over hot ashes, mix with fish fat (liver) for colds'.⁵³ Angas painted an object that he described as '*Kaikoonga* – Bones of a fish found in the Murray, worn as a head ornament, in the same manner as the teeth of the kangaroo' (Angas 1847a: Plate XXX). String-games or 'cats-cradles' played by Lower Murray and South East women and children often featured 'fishing nets' (Tindale 1931–34: 88).⁵⁴

The wide distribution of recorded modifications to the landscape to assist in capturing or storing fish in the Lower Murray and neighbouring coastal and riverine areas indicates that their use, in pre-European times, was a major subsistence strategy. Lourandos has described some earthworks by Aboriginal people in temperate southern Australia as artificial drainage systems operating to flush fish from swamps into channels set with traps (Lourandos 1997: 219–221, 227). This form of swamp management coped with excess water during floods and helped retain water in times of drought. This was part of a subsistence pattern that allowed for a larger and semi-sedentary human population, in comparison to other regions. The material culture and diet of Aboriginal people living in the south would therefore have significantly differed from groups to the north and particularly those situated some distance away from major bodies of water. Fish

⁵⁰ Supporting references are Angas (1847b: Plates IX & XXV).

⁵¹ Harvey (1939ms) and Tindale (1930–52: 248–249) sketched the manner in which fish were cut up and have given the Yaraldi names for the pieces.

⁵² Tindale & Mountford (1936: 496). See photograph in Hemming & Jones (2000: 17).

⁵³ N.B. Tindale specimens (A68579 – *Eucalyptus oleosa*; A68585 – *E. foecunda*; A75835 – unknown *Eucalyptus* species) collected '3 miles north of Swan Reach', 5 August 1964. Clarke (1989: 3) has a similar record relating to mulloway liver.

⁵⁴ In 1930 Tindale collected a string-game (A14962), called 'fishing net', from Amy Johnson (Yaraldi people, Lower Lakes). A string-game (A66733), described as a Tangani 'fish net game' from the Coorong, was possibly a replica made by Tindale in 1934 (see Hemming & Jones 2000: 19). In 1930 D.S. Davidson and N.B. Tindale collected at Swan Reach a string-game (A14958), called a 'net', made by Jerry Mason (Yiraruka people, Murray River).

storage in pounds and mud pools was a pre-European Aboriginal practice for managing the windfall/drought situation of food gathering. Another Lower Murray technique to extend the use of fish food in pre-European times was to dry fish on racks (Berndt & Berndt 1951: 29). Because of the highly seasonal nature of fishing, it is likely that some of the stone and wood structures found in southeastern Australia, identified by archaeologists as fish or eel-traps, would be better described as fish pounds, being for storage rather than capture.

Among the Lower Murray people, many of their totemic familiars, the *ngaitji*, were species of fish (Berndt & Berndt 1993: 306–312). This was also the case for totemic groups along the Murray River (Tindale 1953: 37, 49). In their daily life, menstruating women in the Lower Lakes and Murray River areas were forbidden to eat fish (Berndt & Berndt 1993: 124–126, 141; Eyre 1845, 2: 295; Harvey 1939ms). These women were not allowed to go near the water at all, as it was considered that the success of men fishing would be spoiled. On one occasion in the past, a large incursion of seawater brought a considerable number of *poronti* (sea mullet, *Mugil cephalus*) into the Coorong lagoon (Tindale 1931–34: 119). In spite of their abundance, amongst the Tangani people only old men were allowed to eat them. The mulloway would swim into the Coorong lagoon to spawn under the limestone cliffs (Tindale 1931–34: 119). In this condition only old men were allowed to spear them. Similarly, if young men ate *pelengeri* fish (unknown species), they would prematurely become baldheaded and grey (Tindale 1934–37: 39).

In the Lower Lakes no Yaraldi women, except the elderly, were allowed to eat catfish (Harvey 1939ms). Similarly, young Yaraldi girls were not allowed to eat big-bodied *kai:kuanggi* ('freshwater bream' – possibly black bream, *Acanthopagrus butcheri*). Women during menstruation were not allowed to go near water or to eat fish caught with nets, as the Yaraldi believed it would drive the fish away. In recorded versions of the Ngurunderi Dreaming, his fleeing wives cooked and ate *tukkeri* (bony bream) fish.⁵⁵ The importance of this particular episode is explained in various ways, depending on the particular account. These are that the wives were

breaking a food prohibition by eating this fish species; that the fat exploded in the fish, making them sacred to Ngurunderi; and that the wives incurred Ngurunderi's wrath by giving him the smaller of the two fish they had cooked. The unifying theme in all versions is that this fish was not to be eaten by women.

In the Murray River region more restrictions were placed upon females until past the age of child bearing than upon males of the same age (Eyre 1845, 2: 293). Teichelmann stated that in southern South Australia, food prohibitions were such that women with children were prohibited from eating certain food and that they generally lived upon vegetables (Teichelmann 1841: 7). The categories of people with least amount of food prohibitions appear to have been infants and the elderly. Eyre said that in the Murray River area 'No restrictions are placed upon very small children of either sex, a portion being given to them of whatever food their parents may have. About nine or ten years appears to be the age at which limitations commence' (Eyre 1845, 2: 293–295). He also stated that old men and women were able to eat most things. All prohibitions would have been based on cultural logic, even if the reasons were obscured from those practising the ritual. People generally excluded from prohibitions were those not sexually or economically active. It was the power to produce, either physically or spiritually, at particular life stages that was perceived as making people sensitive to influences potentially harmful to group harmony. In a sense, an individual's position in the society could be defined by what the person could eat and what economic activities they could engage in. The major categories determining prohibitions appear to have been age, gender and initiation status.

Aboriginal people could, at certain times, exercise a degree of choice in the food they lived on. For instance, some Lower Murray animal foods such as fish, emu and kangaroo meat were highly favoured foods when available. Yet vegetable foods such as roots were probably the mainstay when meat was not easily obtainable (Clarke 1988: 73–74). A report from the Adelaide-based Statistical Society in 1842 illustrates the seasonality of Aboriginal food in the southern areas.⁵⁶ The report notes that in

⁵⁵ Accounts summarised from Berndt & Berndt (1993: 224, 435), Clarke (1995: 149, 1999b: 54) and Tindale (1934–37: 285).

⁵⁶ 'Transactions of the Statistical Society. Report on the Aborigines of South Australia.' *Register* newspaper, 8 January 1842. Thomson (1939) also considered the seasonal aspects of Aboriginal culture.

spring mainly vegetables and grubs were eaten. With the commencement of summer, fish were obtained, as were kangaroos, emus, lizards and the eggs and young of birds. During the hottest part of the year possums and acacia gum were procured, while in autumn berries and nectar were available. In the winter a variety of roots were consumed, as were possums and other animals.

The coastal zones of southern South Australia were rich in natural resources, particularly food such as fish, molluscs and coastal berries. Meat from occasional whale strandings was also an attractive coastal food source (Clarke 2001a). Although many of these foods were available for the greater part of the year, the onset of winter made the coast a harsh zone in which to live. Partly for this reason, 'salt water' Aboriginal groups in southern South Australia would have moved according to season between inland and the coast. Stable isotope analysis of human bone indicates that 'salt water' groups did not penetrate up the Murray River beyond the boundaries of the Lower Murray cultural region (Pate 1997, 1998, 2000). The pattern in the Adelaide region was a general movement away from the coast in late autumn, so that more substantial shelters could be built in the protected Mount Lofty Ranges foothills (Clarke 1991: 58–59; Ellis 1976: 116–117; Ross 1984: 5; Tindale 1974: 60–61). The historical record shows similar early patterns for coastal groups from the Lower South East of South Australia (Foster 1983: 23–43). Seasonal movements, although an aspect of the Aboriginal relationship to the physical environment, are essentially dictated by the 'cultural landscape'.

A seasonal population movement occurred among at least some Lower Murray Aboriginal groups. In winter the 'salt water' Tangani people camped along the mainland side of the Coorong lagoon, where firewood was plentiful and shelter from weather available.⁵⁷ The fish-traps maintained there, where the water is shallow, provided a reliable source of food. During summer these Tangani people camped on the Youngusband Peninsula between the Coorong and the Southern Ocean, giving them easy access to coastal foods such as marine fish and berries. There were also political reasons for the movements, with the actions of neighbours impacting on Lower Murray groups. For example, one of the disadvantages of camping on the mainland side of the Coorong was that here the

Tangani were open to attack from the Ngarkat people, who normally ranged in mallee areas to the east of the Lower Murray. During harsh summers the Ngarkat people were forced towards the Murray River and Lower Lakes when their water supplies dwindled, but the Tangani considered that they were not likely to be attacked during the winter. The locations of most Lower Murray seasonal camps are not known, although more archaeological research may improve our present knowledge. For 'fresh water' Lower Murray people, such as the Yaraldi-speaking groups living along the edge of Lake Albert and Lake Alexandrina, the yearly movement was probably from the lakeshore to nearby inland areas, in order to maximise food supplies and comfort (see Fig. 2). During warmer months lakeside camps were cooler as well as being close to freshwater food sources. In contrast, during winter, campsites in close proximity to large bodies of water were more exposed to cold weather. Back from the lakeside, the forests provided natural windbreaks and had more firewood and hut building materials available. The prominence of aquatic technology used by the Lower Murray people would have given them little interest in the remote and harsh inland regions.

CONCLUSION

Resource usage by early Lower Murray Aboriginal people was a function of the broader environmental and regional patterning of the landscape. Aboriginal people in the Lower Murray were not randomly dispersed over the landscape; Ngarrindjeri people were restricted to the riparian/marine areas that were consistent with their material culture. They were, among other things, regionally organised according to their perception and use of the natural resources. The Lower Murray people considered their relationship with the environment to be an active one. Not only did they physically manipulate their resources, they also considered themselves to be influenced and organised by the environment. The material culture of the Lower Murray people, although having some aspects in common with water-based subsistence cultures in the South East and the Murray River regions, was distinctive. They were largely a cultural group confined to the riparian/

⁵⁷ Tindale (1938: 21, 1974: 61–62).

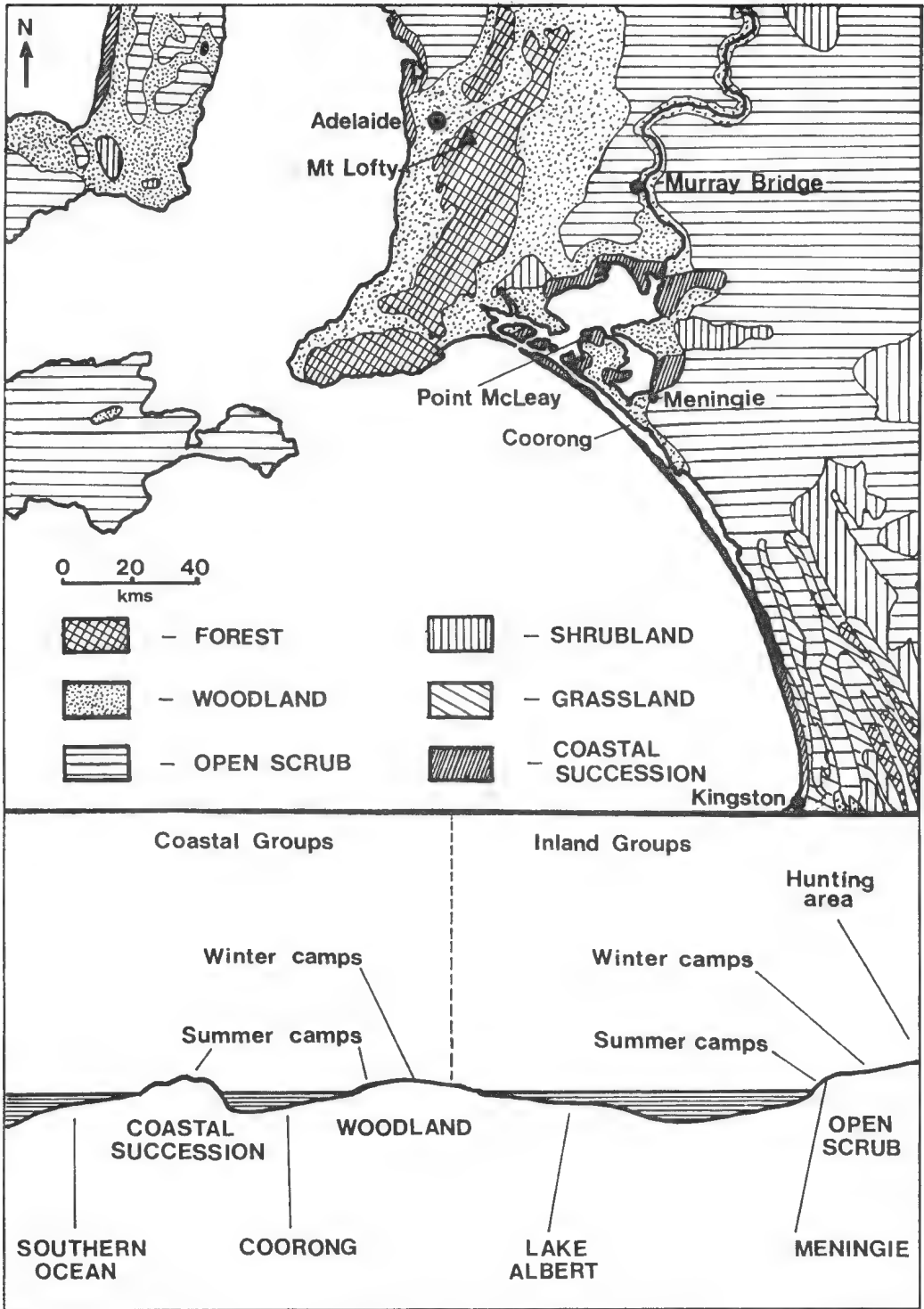


FIGURE 2. Pre-European vegetation of southern South Australia (after Boomsma & Lewis 1980: map) and Aboriginal camping zones in the Lower Murray.

coastal habitats of the southern coastal region of South Australia. Their hunting and gathering practices help to define this cultural region. Approaches in cultural geography, focusing on the cultural construction and perception of the landscape, are well suited to the study of Aboriginal environmental knowledge.

ACKNOWLEDGMENTS

A draft of this paper appeared in the author's PhD thesis, which was supervised by C Anderson, P Smailes and K Garbett. T Sim checked the scientific names of the fish species.

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